10.5 Recovery Test Fixture Test Option

If an equipment manufacturer chooses, as an alternative to the actual vehicle, it may certify to SAE J2788 with a laboratory fixture that is composed entirely of all the original equipment parts of a single model year for the 3.0 lb capacity front/rear A/C system in the 2005–07 Chevrolet Suburban. All parts must be those OE-specified for one model year system and no parts may be eliminated or bypassed from the chosen system, or reproduced by a non-OE source. No parts may be added and/or relocated from the OE position in the 2005–07 Suburban. No parts may be modified in any way that could affect system performance for testing under this standard, except adding refrigerant line bends and/or loops to make the system more compact. Reducing the total length of the lines, however, is not permitted. The fixture system shall be powered by an electric motor, run at a speed not to exceed 2000 rpm, and for this test option, no system warm-up or equivalent procedure may be used. The certifying laboratory shall maintain records of all parts purchased, including invoices and payments. The assembly of the parts shall, as an outside-the-vehicle package, duplicate the OE system and its routing, including bends, except for permitted additions of bends and/or loops in refrigerant lines. Aside from the absence of engine operation and the limitations posed by the standard and the use of the electric motor, the test shall otherwise be the same as the test on the Suburban, including test temperature.

[72 FR 63495, Nov. 9, 2007]

APPENDIX D TO SUBPART B OF PART 82—STANDARD FOR HFC-134A RECOVER-ONLY EQUIPMENT

SAE J2211, Recommended Service Procedure for Containment of HFC-134a, as set forth under Appendix C of this subpart, also applies to this Appendix D

SAE J1732, issued December, 1994.

HFC-134A (R–134A) EXTRACTION EQUIPMENT FOR MOBILE AUTOMOTIVE AIR-CONDITIONING SYSTEMS

Foreword

Appendix C established equipment specifications for on-site recovery and reuse of HFC-134a in air-conditioning systems. These specifications are for HFC-134a extraction only equipment that are intended to be used in conjunction with the on-site recycling equipment currently used at service facilities, or allow for off-site refrigerant reclamation.

1. Scope

The purpose of this standard is to provide equipment specification for only the recovery of HFC-134a refrigerant to be returned to a refrigerant reclamation facility that will process it to ARI Standard 700–93 or allow for recycling of the recovered refrigerant to SAE J2210 specifications by using Design Certified equipment of the same ownership. It is not acceptable that refrigerant removed from a mobile air conditioning system with this equipment be directly returned to a mobile air-conditioning system.

This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar HFC-134a air conditioning systems.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified.

2.1.1 SAE Publications—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096–0001.

SAE J639—Vehicle Service Coupling

SAE J2210—HFC-134a Recycling Equipment for Mobile Automotive Air Conditioning Systems

SAE J2196—Service Hoses for Automotive Air-Conditioning

SAE J2197—Service Hose Fittings for Automotive Air-Conditioning

2.1.2 ARI Publication—Available from Air Conditioning and Refrigerant Institute, 1501 Wilson Blvd. Sixth Floor, Arlington, VA 22209.

ARI 700–93—Specifications for Fluorocarbon Refrigerants

2.1.3 CGA Publications—Available from CGA, 1235 Jefferson Davis Highway, Arlington, VA 22202.

CGA Pamphlet S–1.1—Pressure Relief Device Standard

Part 1—Cylinders for Compressed Gases

2.1.4 DOT Publications—Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DOT Standard, 49 CFR 49 173.304—Shippers-General Requirements for Shipments and Packagings

2.1.5 UL Publications—Available from Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062–2096.

UL 1769—Cylinder Valves

3. Specification and General Description

3.1 The equipment must be able to extract HFC-134a from a mobile air-conditioning system.

3.2 The equipment shall be suitable for use in an automotive service garage environment as defined in section 6.8.

3.3 Equipment Certification—The equipment shall be certified by Underwriters Laboratories or an equivalent certifying laboratory to meet this standard.

3.4 Label Requirements—The equipment shall have a label ''Design Certified by (Company Name) to meet SAE J1732 for use only with HFC-134a. The refrigerant from this equipment must be processed to ARI 700–93 specifications or to SAE J2210 specifications by using Design Certified equipment of the same ownership.'' The minimum letter size shall be bold type 3 mm in height.

4. Safety Requirements

4.1 The equipment must comply with applicable federal, state, and local requirements on equipment related to the handling of HFC-134a material. Safety precautions or notices or labels related to the safe operation of the equipment shall also be prominently displayed on the equipment and should state ''CAUTION—SHOULD BE OPERATED BY CERTIFIED PERSONNEL.'' The safety identification shall be located on the front near the controls.

4.2 The equipment must comply with applicable safety standards for electrical and mechanical requirements.

5. Operating Instructions

5.1 The equipment manufacturer must provide operating instructions that include information required by SAE J1629, necessary maintenance procedures, and source information for replacement parts and repair.

5.1.1 The instruction manual shall include the following information on the lubricant removed. Only new lubricant, as identified by the system manufacturer, should be replaced in the mobile air conditioning system. Removed lubricant from the system and/or the equipment shall be disposed of in accordance with the applicable federal, state, and local procedures and regulations.

5.2 The equipment must prominently display the manufacturer's name, address, the type of refrigerant it is designed to extract, a service telephone number, and any items that require maintenance or replacement that affect the proper operation of the equipment. Operation manuals must cover information for complete maintenance of the equipment to assure proper operation.

6. Functional Description

6.1 The equipment must be capable of ensuring removal of refrigerant from the system being serviced by reducing the system pressure to a minimum of 102 mm (4 in) of mercury below atmospheric pressure (*i.e.*, vacuum). To prevent system delayed outgassing, the unit must have a device that assures the refrigerant has been recovered from the air-conditioning system.

6.1.1 Testing laboratory certification of the equipment capability is required which shall process contaminated refrigerant samples at specific temperatures.

6.2 The equipment must be preconditioned by processing 13.6 kg (30 lb) of the standard contaminated HFC-134a at an ambient of 21 °C (70 °F) before starting the test cycle. Sample amounts are not to exceed 1.13 kg (2.5 lb) with sample amounts to be repeated every 5 minutes. The test fixture shown in Figure 1 to Appendix A of this subpart shall be operated at 21 °C. Contaminated HFC-134a samples shall be processed at ambient temperatures of 10 and 49 °C, without equipment shutting due to any safety devices employed in this equipment.

6.2.1 Contaminated HFC-134a sample

6.2.2 Standard contaminated HFC-134a refrigerant, 13.6 kg sample size, shall consist of liquid HFC-134a with 1300 ppm (by weight) moisture at 21 °C and 45,000 ppm (by weight) of oil (polyalkylene glycol oil with 100 cs viscosity at 40 °C or equivalent) and 1000 ppm by weight of noncondensable gases (air).

6.3 Portable refillable containers used in conjunction with this equipment must meet applicable DOT Standards.

6.3.1 The container color must be blue with a yellow top to identify that it contains used HFC-134a refrigerant. It must be permanently marked on the outside surface in black print at least 20 mm high ''DIRTY HFC-134a—DO NOT USE, MUST BE REPROCESSED''.

6.3.2 The portable refillable container shall have a ½ inch ACME thread.

6.3.3 During operation, the equipment shall provide overfill protection to assure that the storage container liquid fill does not exceed 80% of the tank's rated volume at 21 °C per DOT Standard, 49 CFR 173.304 and the American Society of Mechanical Engineers.

6.4 Additional Storage Tank Requirements

6.4.1 The cylinder valve shall comply with UL 1769.

6.4.2 The pressure relief device shall comply with CGA Pamphlet S–1.1.

6.4.3 The container assembly shall be marked to indicate the first retest date, which shall be 5 years after date of manufacture. The marking shall indicate that retest must be performed every subsequent 5 years. The markings shall be in letters at least 6 mm high.

6.5 All flexible hoses must meet SAE J2196 for service hoses.

6.6 Service hoses must have shutoff devices located within 30 cm (12 in) of the connection point to the system being serviced to minimize introduction of noncondensable gases into the recovery equipment during connection and the release of the refrigerant during disconnection.

6.7 The equipment must be able to separate the lubricant from recovered refrigerant and accurately indicate the amount removed from the simulated automotive system during processing in 30 mL units.

6.7.1 The purpose of indicating the amount of lubricant removed is to ensure that a proper amount of new lubricant is returned to the mobile air conditioning system for compressor lubrication.

6.7.2 Refrigerant dissolved in this lubricant must be accounted for to prevent system lubricant overcharge of the mobile air-conditioning system.

6.8 The equipment must be capable of continuous operation in ambient temperatures of 10 °C to 49 °C and comply with 6.1 and 6.2.

7. For test validation, the equipment is to be operated according to the manufacturer's instructions.

Application

The purpose of this standard is to provide equipment specification for only the recovery of HFC-134a refrigerant to be returned to a refrigerant reclamation facility that will process it to ARI Standard 700–93 or allow for the recycling of the recovered refrigerant to SAE J2210 specifications by using Design Certified equipment of the same ownership. It is not acceptable that the refrigerant removed from a mobile air-conditioning system with this equipment be directly returned to a mobile air-conditioning system.

This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar HFC-134a air-conditioning systems.

Reference Section

SAE J639—Vehicle Service Coupling
SAE J2210—HFC-134a Recycling Equipment for Mobile Automotive Air Conditioning Systems
SAE J2196—Service Hoses for Automotive Air-Conditioning
ARI 700–93—Specifications for Fluorocarbon Refrigerants
CGA Pamphlet S–1.1—Pressure Relief Device Standard Part 1—Cylinders for Compressed Gases
UL 1769—Cylinder Valves
49 CFR 173.304—Shippers—General Requirements for Shipment and Packagings

[62 FR 68052, Dec. 30, 1997]

EFFECTIVE DATE NOTE: At 73 FR 34647, June 18, 2008, appendix D to subpart B was revised, effective Sept. 16, 2008. For the convenience of the user, the revised text is set forth as follows:

APPENDIX D TO SUBPART B OF PART 82—SAE J2810 STANDARD FOR RECOVERY ONLY EQUIPMENT FOR HFC–134A

FOREWORD

This Appendix establishes the specific minimum equipment requirements for the recovery of HFC–134a that has been directly removed from, motor vehicle air-conditioning systems.

1. Scope

The purpose of this SAE Standard is to provide minimum performance and operating feature requirements for the recovery of HFC–134a (R–134a) refrigerant to be returned to a refrigerant reclamation facility that will process it to the appropriate ARI 700 Standard or allow for recycling of the recovered refrigerant to SAE J2788 specifications by using SAE J2788-certified equipment. It is not acceptable that the refrigerant removed from a mobile air-conditioning (A/C) system with this equipment be directly returned to a mobile A/C system.

This information applies to equipment used to service automobiles, light trucks, and other vehicles with similar HFC–134a (R–134a) A/C systems.

1.1 Improved refrigerant recovery equipment is required to ensure adequate refrigerant recovery to reduce emissions and provide for accurate recharging of mobile air conditioning systems. Therefore, 12 months following the publication date of this standard, it supersedes SAE J1732.

2. References

2.1 Applicable Publications

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096–0001, Tel: 877–606–7323 (inside USA and Canada) or 724–776–4970 (outside USA), *http://www.sae.org*.

SAE J639 Safety Standards for Motor Vehicle Refrigerant Vapor Compressions Systems.

SAE J1739 Potential Failure Mode and Effects Analysis in Design (Design FMEA) and Potential Failure Mode and Effects Analysis in Manufacturing and Assembly Processes (Process FMEA) and Effects Analysis for Machinery (Machinery FMEA).

SAE J1771 Criteria for Refrigerant Identification Equipment for Use with Mobile Air-Conditioning Systems.

SAE J2196 Service Hose for Automotive Air Conditioning.

SAE J2296 Retest of Refrigerant Container.

SAE J2788 HFC–134a (R–134a) Recovery/Recycling Equipment and Recovery/Recycling/Recharging for Mobile Air-Conditioning Systems.

2.1.2 ARI Publication

Available from Air-Conditioning and Refrigeration Institute, 4100 North Fairfax